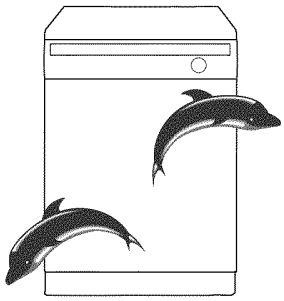
Whirlpool



Service-Manual

Dishwasher integratable ADG 937/1 S

Model ADG 937/1 S
Version 8542 937 01130

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Family	Shadow Range A3

This documentation is only intended for qualified technicians who are aware of the respective safety regulations.

Date: 23.05.1997
Document-No.: 4812 718 12785

Subject to modification

Technical data

Dimension

Height	82,0-87,0	cm
Width	59,5	cm
Depth	57,0	cm
Weight	55,0	kg

Wooden door (for 22 mm thickness)

Thickness min..	16	mm
Thickness max.	25	mm
Width min.	592	mm
Width max.	595	mm
Height min.	628	mm
Height max.	718	mm
Weight min.	2,5	kg
Weight max.	6,5	kg
Max. stick out over lower edge of appliance door	90	mm
Height of plinth min.	93	mm

Specification (normal program)

Capacity	12	standard setting pl.
Water consumption	22	l
Energy consumption	1,5	kWh
Program time	~ 82	min
Noise level	54	db (A)
Detergent consumption	25	ml
Salt consumption by 21 ° dh	< 20	g
Hot water connect. up to	60	°C

Program information (acoustic)

End

Volume (normal program)

Water	Volume	Level
Regeneration	0,3 l	15 mm
Back rinse 3x	1,0 l	68 mm
Prewash	5,0 l	125 mm
Main wash	6,0 l	129 mm
Intermediate rinse 1	5,0 l	125 mm
Clear rinse	5,0 l	125 mm
Safety / overflow	8,5 l	141 mm

Measuring the level

Remove the coarse sieve, put in a measuring meter into the sump, measure the hight of the water level.

Detergent max.

Pre-wash	10	cm^3
Main-wash	45	cm^3
Rinse aid	125	cm^3
6 Dosage steps	1 - 6	cm^3

Water softener

Saltcontainer	2	kg
Resin container	900	cm^3
Regeneration dosage	300	cm^3

Water pressure

Inlet pressure	0,3-10	bar
Spray pump pressure	0,4	bar

Rotations

Spray pump motor	2800	RPM
Drain pump motor	2800	RPM
Spray arm lower	~ 30	RPM
Spray arm upper	~ 35	RPM
Ceiling rotor	~ 60	RPM

Flow rates / Inlet volume

Flow meter (at 0,3 bar = quantity 1,1 l/min)	208	Imp/l
Spray pump	~ 70	l/min
Drain pump	16	l/min
Pump height max.	1,3	m
Inlet valve	4,5	l/min
Spray arm lower	33	l/min
Sprayarm upper	30	l/min
Ceiling rotor	8	l/min

Water distribution

Fine sieve	100	%
Micro filter	~ 30	%

Electrical data

Base data

Voltage	230	V
Frequency	50	Hz
Total power	~ 3	kW
Fuse	16	A

Technical data

Motor

Spray pump motor

Voltage	220/230	V
Power consumption	~190	W
HI	69	Ω
HA	36,2	Ω
Capacitor	4	µF

Drain pump motor

Voltage	220/240	V
Resistance	146	Ω

Heating

1 Element system

Voltage	230	V
Power consumption	2800	W
Resistance	8,6 - 9,5	Ω
Heating speed	~ 2,5	°C/min
Temperature on surface	~ 115	°C
Double safety thermostat self reset	85	°C

Potentiometer

Position 0	2,0	kΩ
Position 1	4,3	kΩ
Position 2	9,0	kΩ
Position 3	13,3	kΩ
Position 4	17,5	kΩ
Position 5	22,2	kΩ
Position 6	24,2	kΩ

Water valves

Single valve

Voltage	220/240	V
Frequency	50/60	Hz
Resistance	2,06	kΩ

Regenerating valve

Voltage	220/240	V
Frequency	50/60	Hz
Resistance	3,13	kΩ
Resistance	3,71	kΩ

Coil of dispenser

Voltage	220/240	V
Frequency	50/60	Hz
Resistance	1,43	kΩ

Relay

Heating relay

Voltage	220/240	V
Frequency	50/60	Hz
Resistance	5,5	kΩ

Reedcontact

flow meter

NTC

15 °C	75	kΩ
20 °C	62	kΩ
30 °C	43	kΩ
40 °C	28	kΩ
50 °C	19	kΩ
60 °C	13	kΩ
70 °C	9	kΩ
80 °C	6	kΩ
85 °C	5	kΩ

Regeneration

Volume	300	cm^3
Position 1		
after wash cycles	1	
water hardness	0-60	°dh
	0-10,7	mmol/l
	0-107	°Fh
Salt consumption for regeneration	77	g
Number of cycles with 2 kg salt	26	

Spare part list

Model **ADG 937/1 S**
Service No. **854293701130**
Version **854293701130**

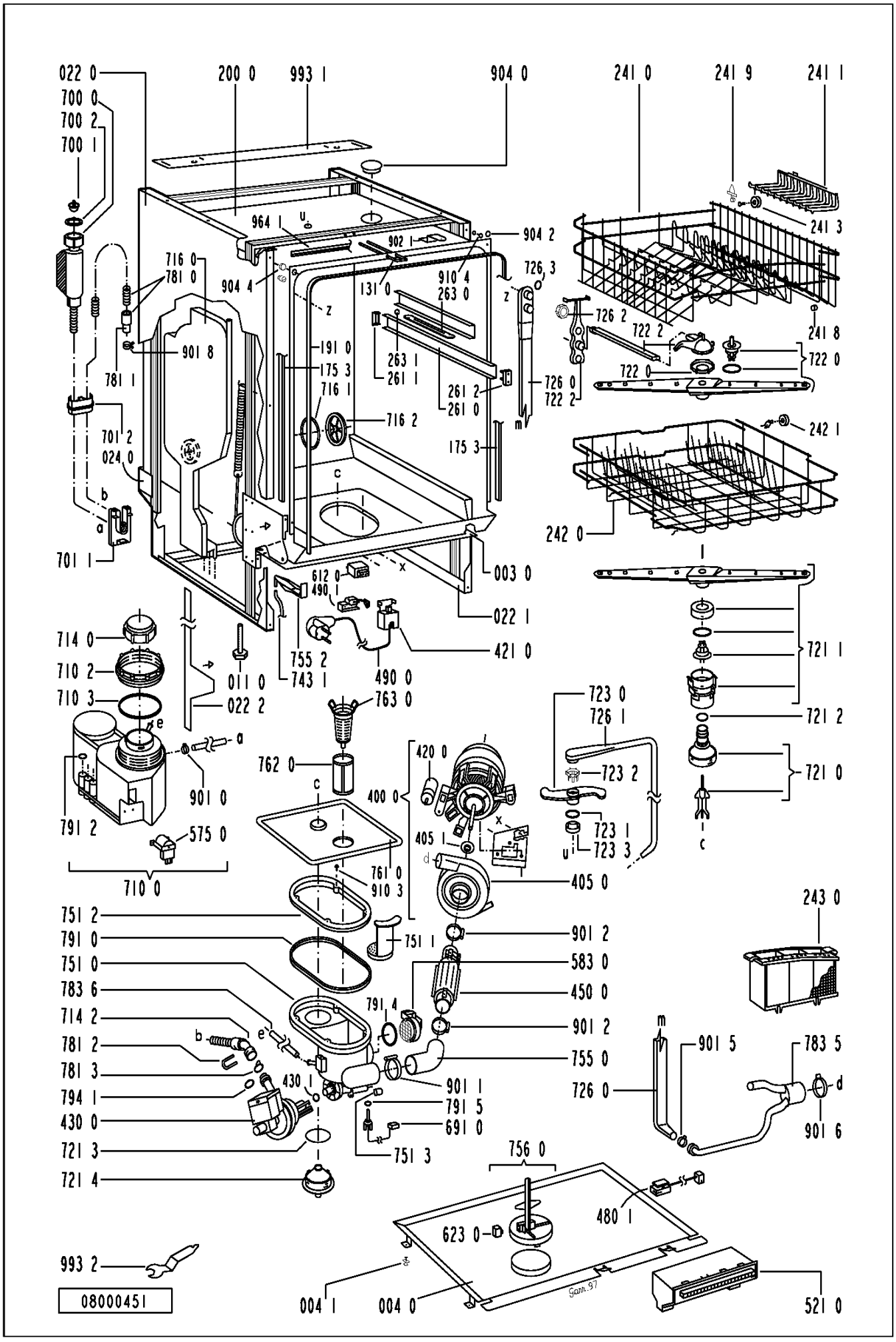
Pos. No.	12NC Code	Description
003 0	**4812 440 19382**	Traverse
004 0	**4812 440 18952**	Drip tray assy
004 1	**4812 401 18402**	Holder
011 0	**4812 505 18369**	Foot long
022 0	**4812 440 19398**	Side panel left
022 1	**4812 440 19397**	Side panel right
022 2	**4812 440 18953**	Spacer
024 0	**4812 440 19401**	Panel, rear
040 1	**4812 417 18774**	Hinge left
040 2	**4812 417 18773**	Hinge right
044 0	**4812 492 38362**	Spring f.door
047 0	**4812 404 48591**	Brake f.door
047 1	**4812 401 18397**	Band,brake
047 2	**4812 404 68023**	Hook
053 0	**4812 440 88876**	Plinth
103 0	**4812 440 18986**	Door outer
105 0	**4812 404 48611**	Fastener door
105 2	**4812 505 68004**	Clip
105 3	**4812 404 48633**	Fastener
120 0	**4812 440 18961**	Door,inner
120 1	**4812 440 18955**	Batten
130 0	**4812 417 58361**	Tilt lock
131 0	**4812 401 18416**	Hook lock
175 3	**4812 466 68532**	Batten
191 0	**4812 466 68534**	Gasket door
192 0	**4812 466 68467**	Gasket, door lower
200 0	**4812 418 18183**	Container cpl.
241 0	**4812 458 18273**	Basket upper straight
241 1	**4812 458 18324**	Holder cups rigth white
241 3	**4812 528 88068**	Wheel,basket upper (set)
241 8	**4812 466 68482**	Spacer cap set
241 9	**4812 528 88075**	Wheel,basket basket upper
242 0	**4812 458 18271**	Basket lower cpl.
242 1	**4812 528 88069**	Wheel,basket lower
243 0	**4812 458 18272**	Basket cutlery
261 0	**4819 462 38271**	Rail telescope, inner
261 1	**4819 404 48819**	Cap rail
261 2	**4812 462 78995**	Cap rail ahead
263 0	**4819 520 18013**	Ball cage cpl.
263 1	**4812 520 48001**	Ball Niro 8 D
301 0	**4812 453 79762**	Control panel WH
322 0	**4812 453 79923**	Insert panel
332 5	**4812 410 28556**	Cap f.beater
400 0	**4812 361 58119**	Motor + spraypump cpl.220/240V
405 0	**4812 360 18358**	Spray pump
405 1	**4819 515 28158**	Gasket
420 0	**4812 121 18132**	Capacitor
421 0	**4812 121 18156**	Interf.filter
430 0	**4812 360 18357**	Pump,draining
430 1	**4812 466 68506**	Ring,sealing
450 0	**4812 259 28653**	Heating element
480 0	**4812 321 28364**	Cable harness set
480 1	**4812 321 28371**	Cable
480 3	**4812 401 18418**	Protector f.wiring
490 0	**4812 310 18403**	KIT cable,mains 3m3x1,5
490 1	**4812 321 28367**	Strain relief
521 0	**4812 214 78165**	Control board (CB) kit
575 0	**4812 281 28361**	Regen.valve
583 0	**4812 271 28355**	Switch diaphragm
612 0	**4812 280 58025**	Relay heating
620 0	**4812 218 38039**	User board (UCB)
623 0	**4812 271 38356**	Microswitch
633 0	**4812 271 38355**	Microswitch
680 0	**4812 418 68133**	Combidosage
680 1	**4812 466 68495**	Gasket
681 1	**4812 466 68497**	Gasket
681 2	**4812 440 18975**	Flap
682 0	**4812 466 68496**	Gasket
691 0	**4812 282 68012**	Feeler NTC
700 0	**4812 530 28788**	Hose, inlet aqua stop 2m
700 0	**4812 530 28804**	Hose, inlet aqua stop 4,2m
700 1	**4812 480 48019**	Sieve
700 2	**4812 520 58002**	Gasket set
701 1	**4812 310 18153**	Yoke clamp set
701 2	**4819 401 18423**	Holder
710 0	**4812 418 68128**	Monoblock
710 2	**4819 310 38536**	Nut threaded ring set
710 3	**4819 466 69562**	Gasket set
714 0	**4812 462 79643**	Threaded cap
714 2	**4812 440 18963**	Cabinet non-return flap
716 0	**4812 418 68147**	Reg.dosage
716 1	**4812 466 68475**	Gasket
716 2	**4812 462 78994**	Cover
721 0	**4812 360 68051**	Hub lower cpl.
721 1	**4812 360 68047**	Arm,spray lower cpl.
721 2	**4812 466 68491**	Gasket 25x2,3B
721 3	**4812 466 68489**	Gasket 76x2,5
721 4	**4812 440 18977**	Flange
722 0	**4812 360 68044**	Arm,spray upper
722 2	**4812 360 68056**	Hub upper straight cpl.
723 0	**4812 360 68049**	Arm,spray
723 1	**4812 466 68483**	Gasket
723 2	**4812 404 48597**	Clip,fix sprayarm
723 3	**4812 505 18362**	Connect,gaspipe
726 0	**4812 530 28786**	Tube
726 1	**4812 530 28787**	Tube
726 2	**4812 505 18358**	Nut
726 3	**4812 466 68512**	Gasket
743 1	**4812 530 28102**	Hose, inlet
751 0	**4812 418 18169**	Water collector
751 1	**4812 418 18171**	Water guide
751 2	**4812 440 18954**	Fastener frame
751 3	**4812 462 78997**	Threaded cap
755 0	**4812 530 28785**	Bend
755 2	**4812 530 48148**	Tray,leak
756 0	**4812 360 58099**	Floater
761 0	**4812 480 58061**	Sieve fine
762 0	**4812 480 58062**	Microfilter
763 0	**4812 480 58057**	Sieve coarse
781 0	**4812 530 28737**	Hose,draining

Spare part list

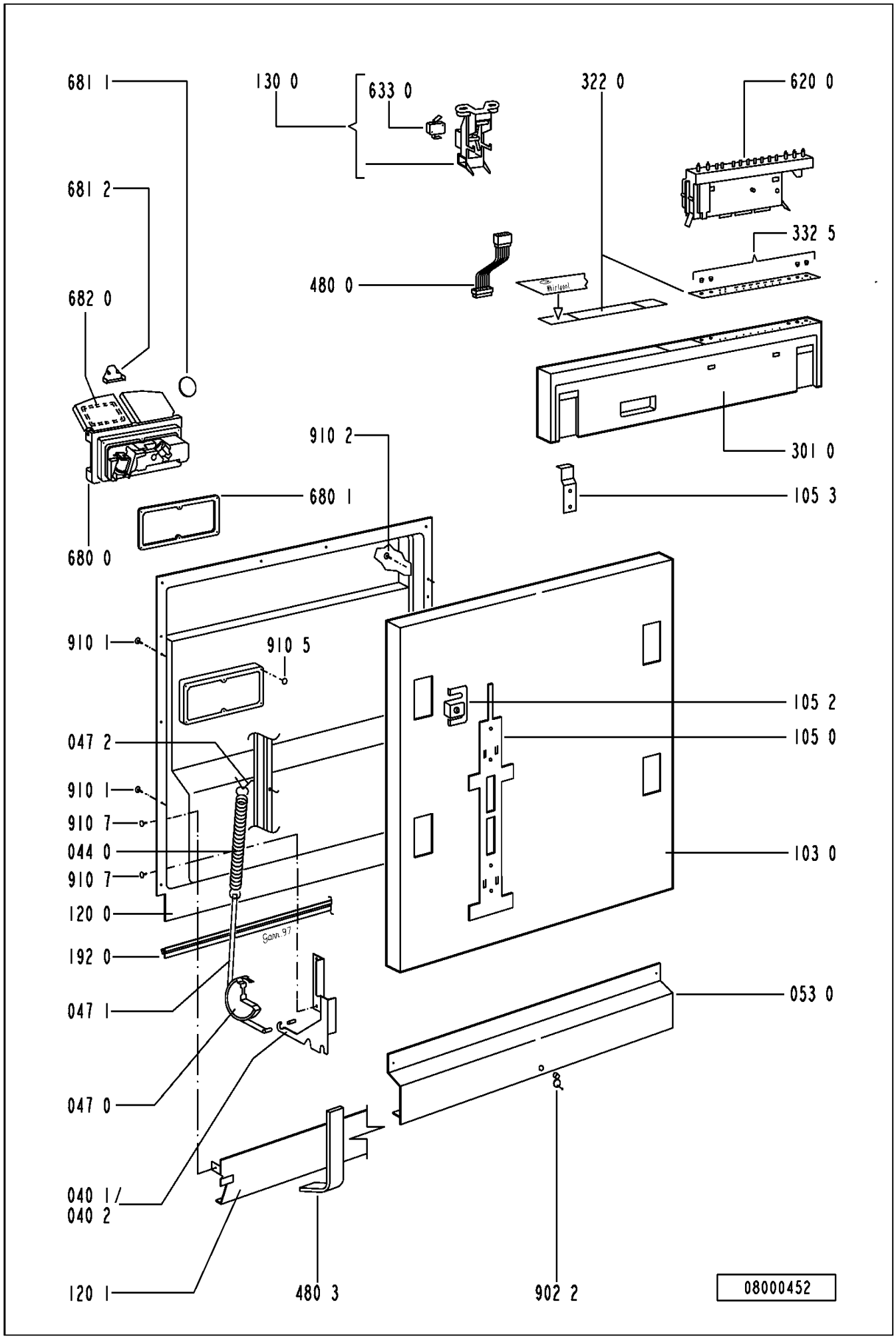
Model **ADG 937/1 S**
Service No. **854293701130**
Version **854293701130**

Pos. No.	12NC Code	Description
781 1	**4819 530 28286**	Sleeve hose
781 2	**4819 492 68405**	Clip f.non-return valve
781 3	**4812 281 28364**	Flap non-return
783 5	**4812 530 78027**	Distributor
783 6	**4812 530 28796**	Hose 10x3x180+10
791 0	**4812 532 68067**	Gasket
791 2	**4812 530 58093**	Gasket
791 4	**4812 466 68503**	Gasket
791 5	**4812 466 68504**	Gasket
794 1	**4819 530 58032**	Gasket 20x2,5
901 0	**4812 401 18191**	Strap 017,8
901 1	**4812 401 18396**	Strap
901 1	**4812 401 48573**	Strap 028,6
901 2	**4812 401 18422**	Strap W1-1 AL 32-50
901 6	**4812 401 48574**	Strap 038,1
901 8	**4812 401 18075**	Strap 20-32/9 mm
902 1	**4812 466 78361**	Fastener f.buildt-in models
902 2	**4812 404 78239**	Holder
904 0	**4812 462 78998**	Threaded cap
904 2	**4812 462 79635**	Cover WH 3,5x5
904 4	**4812 462 79648**	Threaded cap
910 1	**4812 502 18019**	Screw
910 2	**4812 502 18363**	Screw 4,0x12-H
910 3	**4812 502 18364**	Screw 5x20-TORX
910 4	**4812 502 18386**	Screw 3,5x8-TORX T15
910 5	**4812 502 18367**	Screw 3,5x8-TORX T15
910 7	**4812 502 38132**	Screw DIN 965
964 1	**4812 466 68511**	Gasket housing upper
993 1	**4812 466 78018**	Foil protection
993 2	**4812 404 48609**	Socket wreng foot

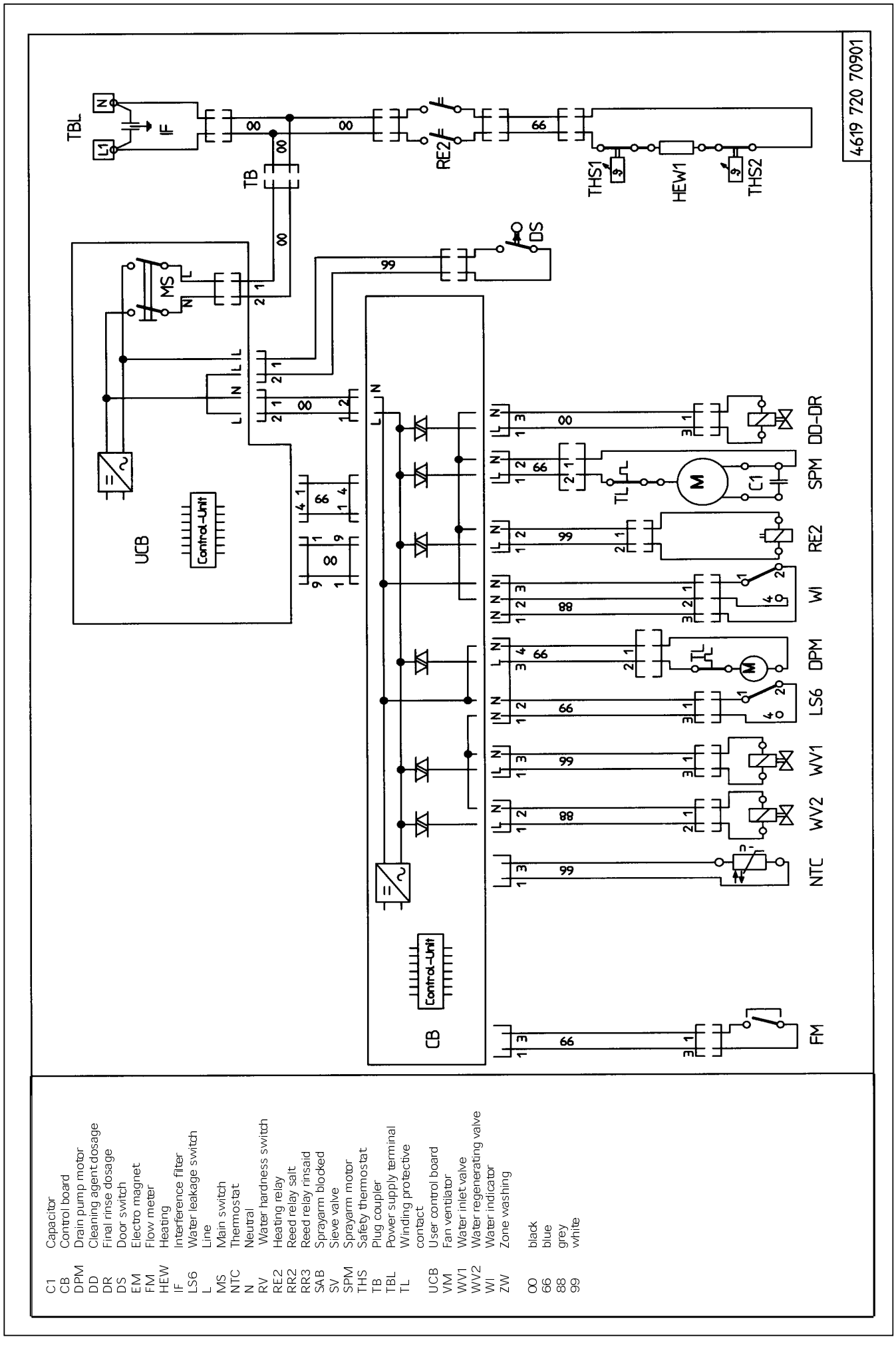
Exploded view



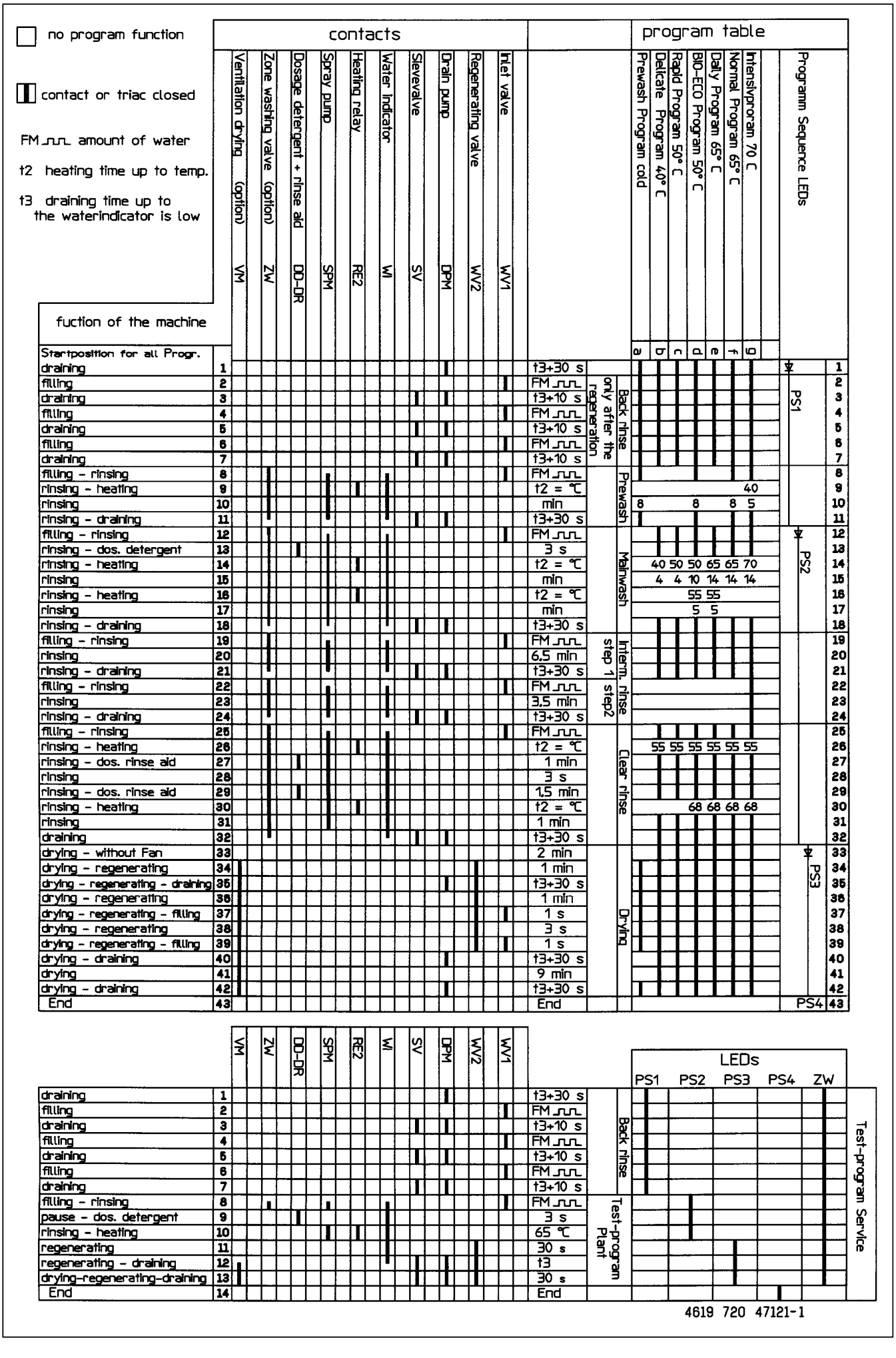
Exploded view



Circuit diagram



Program diagram



Text/Legend

4812 718 98008-1

Test procedure for SERVICE-TEST-PROGRAM DOLPHIN *full-door* dishwashers

If there is a failure on the appliance, the customer will note it by open the door and the rapidly flashing start LED.

1. Open the door. When the start LED flashes rapidly, a failure is indicated. Then finish the program by pushing the start button until the start LED goes off.

   If no more failure is indicated, start service test program.
   Watch the function in accordance with the functional diagram.

2. Check the component.
   Unplug the indicated component from the control board and check it by using an Ohm-measure equipment.
   If the ohms are not correct, check the cables to the component and check the component itself.

3. Only if there is no reaction when pushing a push button, then test with the test points.

4. At the end of the repair start the test program again to see that the failure is solved.

More details: see chapter test program for service.

Attention:

First unplug the appliance, then set the connection clamps of the volt measurement on the test points.
Danger for short circuit.
More details see chapter test point.

Short dircuits on components can damage the control board.
If electronic boards are wet, do not switch the appliance on.

The failures F1 NTC break
F2 water leakage
F9 continuous water inlet
are checked and indicated immediately after start of the program.
Therefore these failures have to be solved before starting the test program.
When these failures are not solved, the test program does not run.

The electrical components get their voltage via triac from the control board. For testing the volume of voltage the volt meter must be parallel to the component (the component must be plugged on). If the component is plugged off, then on the plug the measured voltage is reduced.

Handling of failures

F1. NTC break

- temperature out of the normal value (-10 degr. till +85 degr. C)

Possible failures
- heating higher than +85 degr. C
- NTC defective
- dishwasher is frozen, less than -10 degr. C

Text/Legend

F2. water leakage

- water is in the drip tray
floater (LS6) switches off the WV1 and the electronic switches on the DPM till WI reports empty

F3. heating system defective

- too less heating speed (lower 1,5 degr. in 20 min.)
- heating (HEW) defective
- relais (RE2) defective

F4. draining failure

drain pump starts and after 4 min. the WI detects not empty
- drain pump (DPM) defective
- syphon closed
- control board (CB) defective
- water indicator (WI) defective (is switched on)

F5. spray arm blocked (leads not to stop the appliance)

SAB sensor sends less than 10 impulses/min.
- spray arm blocked or not fixed well
- selfcleaning microfilter blocked
- spray pump (SPM) does not work well
- SAB sensor defective

F6. water tap closed

water valve (WV1) is switched on but flow meter (FM) sends no impulses (less than 10 imp. in 10 sec.) and the water indicator (WI) is at low level
- water tap closed
- water inlet hose blocked
- water inlet valve (WV1) defective
- flow meter (FM) defective (leads to FM failure)

F7. flow meter failure

water inlet valve is switched on and the water indicator (WI) is switched on high level
- flow meter (FM) sends to less impulses
(less than 10 imp. in 10 sec.)
- water tap closed
- water inlet hose blocked
- water inlet valve (WV1) defective
- flow meter (FM) defective
- water indicator (WI) is defective

Text/Legend

F8. water level failure

failure monitored during spray pump is on and the water indicator switches back more than 10 times in 2 min.

- water indicator defective
- sieve blocked
- water strongly foams
- pot has turned off and is filled with spray water
- no stable spray pump (SPM) working

F9. continuous water inlet

water inlet valve (WV1) is switched off, water indicator (WI) on,
flow meter (FM) sends impulses more than 10 imp. in 10 sec.
- water inlet valve (WV1) mechanically not closed
- triac (CB) for WV1 is closed

reaction: interval 30 sec. draining / 20 sec. tracing

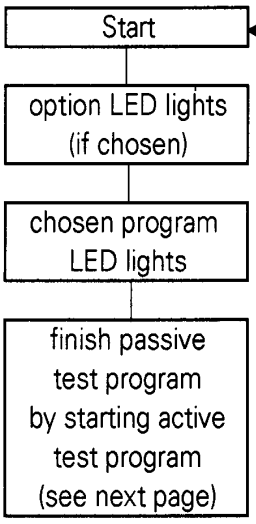
For salt, rinse aid, zone wash valve, sieve valve failure see active test program.

Text/Legend

Indication of failures and alarms on appliances produced until September 1996

failure	failure no.	indication	indication within test program
NTC - break	F1	start LED flashes	start LED flashes
water leakage failure	F2	start LED flashes	start LED flashes
heating system failure	F3	start LED flashes	start LED flashes
draining failure	F4	start LED flashes	"beep" in one sec. rythm (only with door closed)
water tap closed inlet valve defect	F6	start LED flashes till tap will be opened	"beep" in one sec. rythm (only with door closed)
flow meter failure	F7	start LED flashes	"beep" in one sec. rythm (only with door closed)
water level failure	F8	start LED flashes	start LED flashes
water inlet continuously on	F9	start LED flashes	start LED flashes
salt		alarm LED on	alarm LED on
rinse agent		alarm LED on	alarm LED on

Passive test program


Start
option LED lights (if chosen)
chosen program LED lights
finish passive test program by starting active test program (see next page)

The failures are indicated by fast flashing start LED or "beep".

Start procedure:

1. If a program is running, finish it by pushing the start button (door is opened) until the start LED goes off (more than 3 sec.).
2. Close the door, so that the program can finish. (beep!)
3. Open the door again, choose program Bio Eco 50 °C (d) .
4. Switch the appliance off.
5. Push start button and hold it pushed.
6. Switch the appliance on.
7. Release the start button when start LED flashes (after approx. 5 sec.) (the start LED flashes in a slow rhythm - 1,5 sec. on/0,5 sec. off). If the start LED flashes immediately in a fast rhythm - 0,5 sec. on/ 0,5 sec. off, then mostly one of the failures F1, F2 or F9 occur. These failures always have to be solved before test program can be started.
8. Passive test program is ready to start: Check the LEDs by pushing the buttons.

Remark: **If a wrong program is switched on when starting the test program, this will be indicated by a twice short acoustic signal. Then start again as before.**

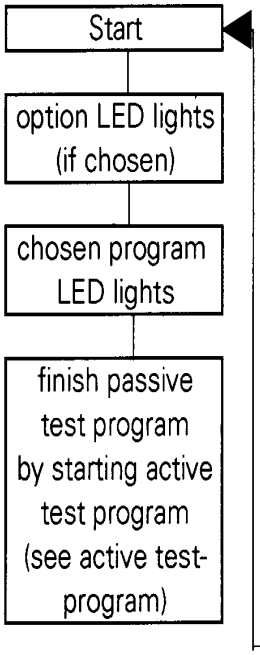
Text/Legend

Indication of failures and alarms on appliances produced from October 1996 on

failure	failure no.	indication	ndication within test prograr	indication within test program by using the display board
NTC - break	F1	start LED flashes	one long "beep"3 sec.	PS 1 flashes
water leakage failure	F2	start LED flashes	one long "beep"3 sec.	PS 2 flashes
heating system failure	F3	start LED flashes	one long "beep"3 sec.	PS 3 flashes
draining failure	F4	start LED flashes	"beep" in one sec. rythm (only with door closed)	PS 4 flashes
water tap closed inlet valve defect	F6	start LED flashes till tap will be opened	"beep" in one sec. rythm (only with door closed)	PS 2+PS 4 flashes
flow meter failure	F7	start LED flashes	"beep" in one sec. rythm (only with door closed)	PS 3+PS 4 flashes
water level failure	F8	start LED flashes	one long "beep"3 sec.	PS 2+PS 3 flashes
water inlet continuously on	F9	start LED flashes	one long "beep"3 sec.	PS 1+PS 3 flashes
salt		alarm LED on	alarm LED on	alarm LED on
rinse agent		alarm LED on	alarm LED on	alarm LED on

The failures are indicated by acoustic signal "beep" or program sequence LED .

Passive test program


Start
option LED lights (if chosen)
chosen program LED lights
finish passive test program by starting active test program (see active test-program)

Start procedure:

1. If a program is running, finish it by pushing the start button (door is opened) until the start LED goes off (more than 3 sec.).
2. Close the door, so that the program can finish. (beep!)
3. Open the door again, choose program Bio Eco 50 °C (d) or Rapid (c).
4. Switch the appliance off.
5. Push start button and hold it pushed.
6. Switch the appliance on.
7. Release the start button when start LED flashes (after approx. 5 sec.) (the start LED flashes in a slow rhythm - 1,5 sec. on/0,5 sec. off). If the start LED flashes immediately in a fast rhythm - 0,5 sec. on/ 0,5 sec. off, then mostly one of the failures F1, F2 or F9 occur. These failures always have to be solved before test program can be started.
8. Passive test program is ready to start: Check the LEDs by pushing the buttons.

Clearer failure indication in the test program by using of a display board in addition
(see next page)

Text/Legend

Clearer failure indication in the test program by using of a display board in addition

A Start passive and active test program as usual.
B When failure indication occures (beep in 1 sec.rythm or one long beep 3 sec.):
-unplug the appliance
-open the door
-open the control panel and disconnect the 9-poles cable from the electronics
-connect the 9-poles cable to the display board
-plug in the appliance
-close the door with opened control panel (door switch must be switched on)
C The failure is indicated by the program sequence LEDs of the display board

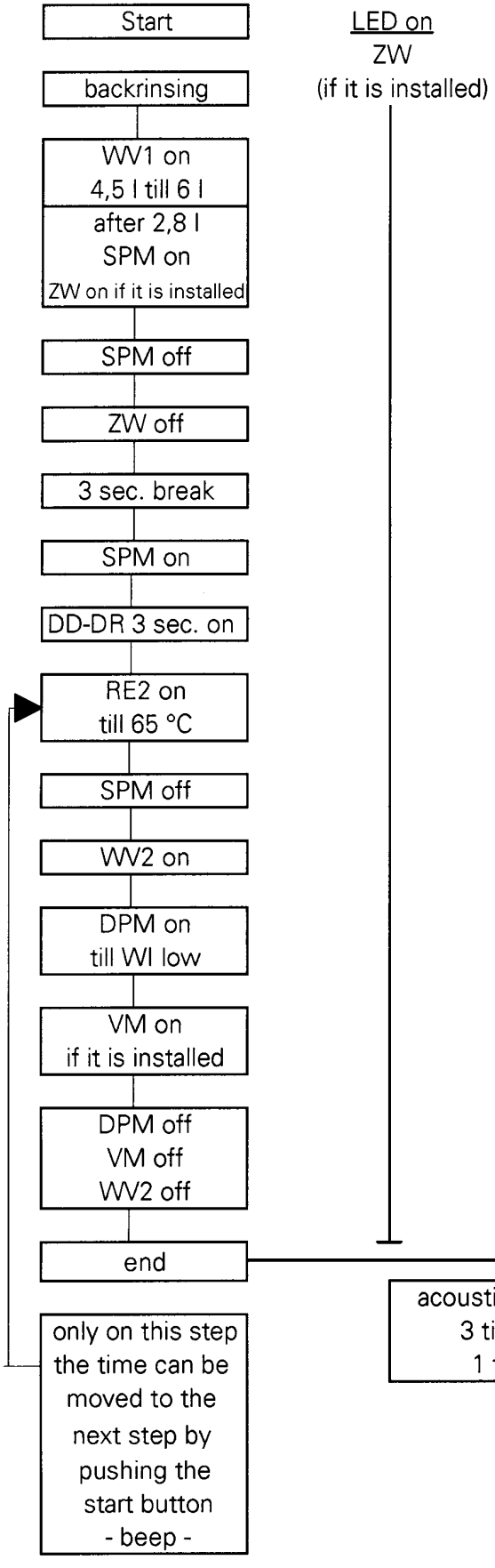
Attention. The display board is not included the appliance.It can be ordered by the Spare Part Centres and used to help the Service.If there is no display board valid then the failure has to be found by following the program chart of the test program.

Display boards to use as a Service help: Some order numbers: 4812 276 58036
4812 276 58037

Remark: **If a wrong program is switched on when starting the test program, this will be indicated by a twice short acoustic signal.**
Then start again as before.

Text/Legend

Active test program



LED on
ZW
(if it is installed)

acoustic signal beep:
3 times short
1 time long

Test procedure
1. passive test program O. K.?
   no: repair failure
   yes: push start button shorter than 3 sec. with door opened
   (acoustic signal: beep)
2. active test program starts
   after closing the door

Remarks
On these appliances the failure can only be found by starting the test program and following this by using the program chart. The failure indicate by fast flashing the start LED, or by "beep" in one sec. rythm (see indication of failures and alarms).
The active test program runs to the failure position and stops or, if there is no failure, to the end.

To leave the test progr. push start button for longer than 3 sec.
2 sec. after closing the door the drain pump runs till end of the program.

Too less salt or too less rinse aid leads not to the stop of the appliance.

The function of the zone wash valve (ZW on) can only be checked optically.
A defect (not closing) leads to an instable SPM pressure.
The function of the sieve valve can only be checked optically.
In case of defect the housing of the selfcleaning microfilter is not empty on the end of the program.

Note:
ZW on means:
ZW is activated
- no water comes to the upper spray arm -
ZW off means:
ZW is not activated
- upper spray arm is turning -

Text/Legend

			Programs						
BK	IG	W P	a	b	c	d	e	f	g
	A3	A3	X		x	⊗		X	
		A5	X		x		X	X	X
B5			X		x		X	X	X
B7			X	X	X	X	X	X	X

⊗ only for IG instead of program c

a prewash cold

b glass 40 degr.

c rapid 50 degr.

d bio eco 50 degr. (with prewash)

e daily 65 degr. (without prewash)

f normal 65 degr. (with prewash cold)

g intensive 70 degr. (with prewash 40 degr.)

After having started a program this program is locked. That means that neither by unplugging/switching off the appliance nor by setting an other program, the first program set can be changed. Changing the program is only possible by pushing the start button again for longer than 3 sec.

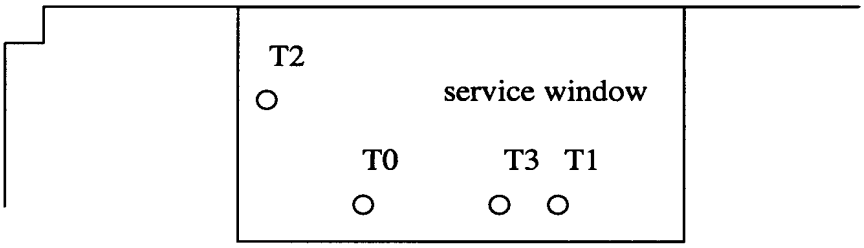
The last program used is always stored. That means if the customer wants to use the same program again, the on-button and the start button have to be pressed.

Text/Legend

Test points on the control board

With these test points the function of the buttons can be checked.
The test points are in the service window on the control board.
For the test fine clamps, cables and volt meter with high input resistance are necessary.
Before setting the clamps on the test points, switch off the appliance.

Test points: T0 = common line T2 = analogue value
T1 = analogue value T3 = digital signal



control board

When the door is opened and the appliance is switched on, then the connection between user control board and control board is interrupted and in all following tests the measured value is zero voltage.

Check: test point T0 to T1
After closing the door, the voltage is always -6 V.
It doesn't matter which button is pushed or not.
This value is also valid after program start.

Check: test point T0 to T2

	voltage	from	to
progr. a	appr. -1,54 V (DC)	user control board	control board
progr. b	appr. -2,06 V (DC)	user control board	control board
progr. c	appr. -2,57 V (DC)	user control board	control board
progr. d	appr. -3,42 V (DC)	user control board	control board
progr. e	appr. -3,96 V (DC)	user control board	control board
progr. f	appr. -4,47 V (DC)	user control board	control board
progr. g	appr. -5,00 V (DC)	user control board	control board

Test the start button
Choose a program and push the start button (start LED goes on).
Close the door:
value like the chosen program see list before.
Short time after closing the door the value decreases to 0 V (start signal) for 3 sec. and then goes back to the voltage value before.

Check: test point T0 to T3
Communication between User-Control board and Controlboard
multiplexing appr. -3,18 V (DC)
How exact the data are depends on the measure equipment.